properties of X-rays, the choice of apparatus, and the technique.

In the first twenty-four pages the apparatus is considered, and the remainder of the work, with the exception of two short chapters, is devoted to brief consideration of a number of skin affections, including malignant disease. The book will certainly be of service to those for whom it is intended, and many practitioners who desire to become acquainted with this new branch of electrotherapeutics will find it a useful introduction. The work is well written and unpretentious, and Dr. Cowen has succeeded in the aim laid down in his preface.

Neue Abhandlungen über den menschlichen Verstand. By G. W. v. Leibniz. Translated, with introduction, by C. Schaarschmidt. Second edition. Pp. lxviii+590. (Leipzig: Dürr'sche Buchhandlung, 1904.) Price 6 marks.

Immanuel Kant's Logik. By G. B. Jäsche. Third edition. New edition by Dr. W. Kinkel. Pp. xxviii+171. (Leipzig: Dürr'sche Buchhandlung, 1904.) Price 2 marks.

Lazarus der Begründer der Völkerpsychologie. By Dr. Alfred Leicht. Pp. 111. (Leipzig: Dürr'sche Buchhandlung, 1904.) Price 1.40 marks.

THE first two of the above-mentioned works appear as parts of the excellent "Philosophische Bibliothek." The translation of the Leibniz into the philosopher's native tongue appears to be all that could be desired, and the introduction gives an analysis of the work. We gather that some 460 explanatory notes are to be found in the succeeding volume of the series. This edition of "Kant's Logik" is intended to supersede the uncritical one of Von Kirchmann, who relied only on the second Hartenstein edition of 1868. The present editor has gone back to the original text of Jäsche, and has also compared the other important editions, the first Hartenstein and the Rosenkranz, both of 1838. The spelling is completely modernised. Prof. Moritz Lazarus was, with Steinthal, the founder of the *Zeitschrift für Völkerpsychologie und Sprachwissenschaft* in 1859, and his works not only contain much sound psychology, but are also permeated by a fine ethical spirit. His long life and labours are here described by a singularly appreciative disciple.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

British Fruit Growing.

THE question of "the diversity of yield from farms in the same neighbourhood" to which you referred in your article on the report of the fruit committee is, as Mr. Alfred Walker remarks, one of very great complexity. No evidence on this subject, however, was offered to the fruit committee by the numerous growers who appeared as witnesses before them, and it would certainly seem to be a subject more suited for investigation at an experimental station than one which could be dealt with by a departmental committee.

Meteorological conditions are, no doubt, primarily responsible for most failures of cropping, and, in a climate such as that of our islands, we can never hope to do more than mitigate the evil effects of inopportune cold. The destruction of the blossoms is generally due—as in 1903—to cooling by radiation, and the best safeguard against this form of cooling is a fairly elevated position, and a lie of the ground favourable to the draining away of the cold air from the plantation. Good air drainage is probably more important in fruit growing than good water drainage. Various means have been investigated for reducing radiation by artificial means, but the results have not yet proved themselves to be successful, at any rate from an economic point of view.

The destruction of blossoms, however, is caused sometimes by a low atmospheric temperature produced by means other than surface radiation. This was the case in the present year, when the destructive cooling agent was a cold wind. A warm, low situation, with plenty of shelter, will afford some safeguard against damage from such a source; and these, unfortunately, are just the conditions which will increase the danger from radiation frosts.

There is no doubt, however, that the damage done by a low temperature is not always done in a direct manner. A continued spell of cold weather at the blossoming season is inimical to the activity of the various insects on which pollination mainly depends, and we are not yet in a position to say that a sluggish action of the roots and leaves may not itself be directly detrimental to the process of fertilisation. The number of apples and, still more, of pears which have been imperfectly fertilised, and have, therefore, dropped prematurely, have been very noticeable this year.

What part the nature of the soil plays in modifying the action of cold on the trees is one which is very difficult to foretell or to determine. We can never have two plantations in different soils while being in exactly similar positions; and the question whether a blossom will be reduced to a lower temperature by radiation in the moist air overlying a clay soil than it would be in the dryer air overlying a gravel soil, or whether, if reduced to the same temperature in both cases, it would suffer more in the one than in the other, is a question on which we cannot dogmatise. We must not be misled by the feeling of cold experienced in two such cases by the human subject; indeed, watering the trees and ground is one of the methods suggested for obviating the effects of radiation frosts. Differences of soil, also, will act indirectly in the matter by affecting the root-action and the forwardness of the blossoms.

On one point, however, I think there can be no doubt, namely, that the best safeguard against injury by frost, where frost is inevitable, is a healthy condition of the tree itself. It has been a matter of continued observation that with similarly situated plantations, and with similar trees in the same plantation, those which are most healthy will nearly always suffer least from frost. It is specially noticeable that with trees which are weakly, even when they carry (as will often happen) a great abundance of blossom, injury from frost is very severe, although the abundance of blossom should be favourable to some of these being preserved from destruction.

It is in this direction—the general health of the trees and the raising of healthier and hardier varieties—that success in diminishing loss by frosts will most probably be achieved. It is hardly probable, I think, that much will be effected, at any rate in the case of apples, by raising varieties blossoming late enough to escape frosts. These frosts, as we all know, often occur very late in the year, and though every day by which the blossoming is retarded must, on the average, diminish the risk of its destruction, there would appear to be but little chance of our being able to retard it sufficiently to diminish that risk to any material extent. It must be remembered, also, that though we might raise a late blossoming apple, it is a hundred chances to one that the fruit would be able to compete in the market with known varieties.

The flowers of the large majority of English apples would appear to open within a period of about ten days. Observations made this year on 117 varieties gave a total range of 16 days, but 98 per cent. of these varieties opened within a range of 13 days, and 84 per cent. within a range of 9 days. The extent of the variation, therefore, is not sufficiently large to offer much promise of success in raising a variety which would escape frost by its lateness of flowering. It is noticeable, however, that our English apples appear to be rather earlier in their flowering than varieties belonging to other countries, when all are grown under the same conditions. The results obtained at Woburn this year were as follows, the dates being those of the opening of the first flowers, and the fractions of dates arising, of course, through the taking of the means. The number of varieties under observation are given, and

© 1905 Nature Publishing Group

those termed English include several varieties of foreign origin which are commonly grown in England. In most cases the trees were on the crabstock :—

117 English	May 6·4
36 Scotch	May 8·9
9 Irish	May 9·4
8 French	May 9·0
(1 German	May 4·0)
7 Russian	May 8·6

Another point of some interest in connection with these results may be mentioned, namely, that there is a connection between the earliness of blossoming and the earliness of the ripening of the fruit, though it is so slight that it becomes apparent only when the averages of a considerable number of varieties are taken, and many individual instances may be noticed where the later fruit follows the earlier blossoming :—

37 Early varieties	May 4·7
40 Mid-season varieties	May 6·3
40 Late varieties	May 8·0

This letter, I fear, is already too long, but it leaves unmentioned several points which may be of importance in determining the fruiting of trees.

SPENCER PICKERING.

Artificial Diamonds.

OF the two phases, diamond and graphite, diamond is the denser, and has also the less internal energy. It follows that, if carbon can be crystallised at comparatively low temperatures, the minimum pressure sufficing to determine the diamond form will be lower than that employed in M. Moissan's experiments.

For estimating the transformation temperature corresponding to low pressures, the data available are incomplete; it is here suggested, however, as a tentative result from experiments which are still in a preliminary stage, that the transformation temperature corresponding to atmospheric pressure lies somewhere between 550° C. and 700° C., or not far outside those limits, temperatures having so far been judged only by eye.

A molten alloy of lead with about 1 per cent. calcium appears to be capable of holding in solution some small proportion of carbon, which exists either as free carbon or as calcium carbide; and if the calcium is eliminated from the molten mass, some carbon crystallises out. Steam, for example, converts the calcium into hydrate without attacking the lead. If the reaction has occurred at a full red heat, graphite is found in the crust of lime; if only a very low red heat has been attained, no graphite is found, but a number of very small or microscopic crystals, which have many of the properties of the diamond. The illustration is from a pencil drawing of a very minute crystal, viewed under a magnification of 80 diameters, and drawn on a greatly enlarged scale.

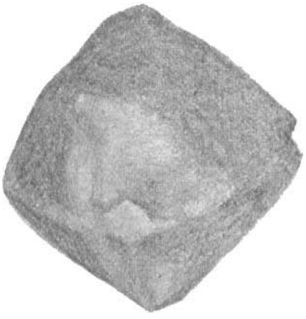

FIG. 1.—Supposed diamond from lead-calcium-carbon solution.

The crystals obtained exhibit mostly faces of the octahedron, modified by the cube and dodecahedron; in no case has any internal flaw or lack of perfect transparency been detected in them. The refractive index is clearly very high, and an attempt to determine it by displacement of focus gave 2·43 (instead of 2·47), any convexity of the refracting surface tending to give too low a value. The crystalline faces are, in fact, generally if not always convex, in many cases strongly so. The crystals adhere tenaciously to clean, dry glass; they are unacted upon by ordinary acids (hot or cold), by cold hydrofluoric acid, and by fused alkali at a red heat. When strongly heated on platinum foil, they burn away, leaving no residue. The quantities at present available are too small for the ready determination of density or hardness.

Negative results were invariably obtained in control experiments on the commercial calcium carbide which was used in preparing the alloys.

Tin may be used in place of lead, but it is freely oxidised by the steam, and the resulting dioxide is troublesome to get rid of. Of other reactions which appear to have yielded minute crystals of diamond, the following may be mentioned :—boiling benzene or toluene in contact with finely powdered potassium dichromate or with concentrated aqueous solution of gold chloride; heating benzene or toluene mixed with carbon tetrachloride or chloroform to 200° C. to 300° C. in a bomb. In the last named reactions, nearly all the carbon separates out in the amorphous form, hydrochloric acid collecting under enormous pressure.

I hope shortly to return to the subject of these experiments, and to make a fitting acknowledgment of my deep indebtedness to Mr. W. J. Hartley, to Messrs. Neville and Heycock, and to other friends.

C. V. BURTON.

4 Chesterton Hall Crescent, Cambridge, August 19.

The Spread of Injurious Insects.

IN 1898 Dr. L. O. Howard forwarded to me a scale insect discovered by Prof. Chaves at Ponta Delgada, Azores, attacking the foliage of the orange tree. The insect proved to be new, and was described as *Lecanium perlatum*. Since that time it has never been reported from any other place; but now I have received some large, flat, dark brown scales on orange leaves from Villa Encarnacion, Paraguay, collected by Mr. Schrottky, and they are this very same *L. perlatum*.[1] This is only one new case to be added to the many already known of scale insects being transported from one side of the world to the other, evidently by human means. It is to be regretted that the British Government, with its numerous tropical colonies and excellent botanical gardens, has not done something to make known the scale insects within its domains. It is true that Mr. E. E. Green, the Government entomologist of Ceylon, is bringing out a magnificent work on the scale insects of that island; but he finds insufficient support, and it is divulging no secret to say that the publication of this useful book will involve him in very serious financial loss. There is no properly classified national collection of scale insects (the only good collection in England is that of Mr. Newstead at Liverpool), and we are still totally ignorant of the coccid fauna of many colonies. The reasons for regretting this condition of affairs are mainly two :—(1) because in ignorance pests of this group are continually being carried to new regions, where they are liable to become destructive; and (2) because man is so mixing up the distribution of these insects that every year makes it more difficult to ascertain their natural habitats. Having regard for the experiences of the past, it is surely safe to say that the annual expenditure of a few hundred pounds in the investigation of these pests would be far more than repaid in economic as well as scientific gains.

T. D. A. COCKERELL.

University of Colorado, U.S.A., August 10.

A Parasite of the House-fly.

I SHOULD like to direct attention to an interesting parasite of the house-fly which is in this district extremely abundant this summer. The creature is, as a rule, very hard to find, and many thousands of flies may be caught in ordinary seasons without a single parasite being found upon them. The animal in question is one of the *Pseudo-Scorpionides* (? Chelifer), easily recognisable by its pair of long chelæ, and I should be glad if any of your readers would inform me to what genus it belongs and whether it is equally abundant this year in other places.

Eton, August 19.

M. D. HILL.

---

[1] In my original description, it is stated that the skin is not reticulated. The new material shows that it is minutely reticulated or tessellate in the middle of the back. The antennæ, described as 8-jointed, vary to 7-jointed, with the fourth joint longest, but the third nearly as long.

© 1905 Nature Publishing Group